

REMARKS

This Amendment and Response is being submitted in response to the final Office Action mailed July 23, 2004. Claims 5 and 14-17 are pending in the Application. Claims 5 and 14-17 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Friese et al. '007 (U.S. Patent No. 5,181,007) in view of Tani et al. (U.S. Patent No. 5,735,606), Murata et al. (U.S. Patent No. 4,901,051), or Gerblinger et al. (U.S. Patent No. 5,430,428). Claims 5 and 14-17 also stand rejected under 35 U.S.C. 103(a) as being unpatentable over Friese et al. '007 in view of Tani et al., as applied to the claims above, and further in view of Wienand et al. (U.S. Patent No. 5,831,512). Claims 16 and 17 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Friese et al. '007 in view of Gerblinger et al., as applied to the claims above, and further in view of Wienand et al.

In response to these rejections, Claim 5 has been amended to further clarify the subject matter which Applicant regards as the present invention. This amendment is fully supported in the specification, drawings, and claims of the Application and no new matter has been added. Based upon the amendment, reconsideration of the Application is respectfully requested in view of the following remarks.

Rejection of Claims 5 and 14-17 Under 35 U.S.C. 103(a) – Friese et al. '007, Tani et al., Murata et al., and Gerblinger et al.:

Claims 5 and 14-17 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Friese et al. '007 (U.S. Patent No. 5,181,007) in view of Tani et al. (U.S. Patent No. 5,735,606), Murata et al. (U.S. Patent No. 4,901,051), or Gerblinger et al. (U.S. Patent No. 5,430,428).

Specifically, Examiner states:

Friese discloses the claimed invention at Figs. 1 or 2 except the platinum film resistor 6 being thin film and the glass. As an alternative, applicant argues that his claims are thin film pastes. This is met by the thick film paste of Friese, where

thick or thin, in the context of applicant's arguments, are a matter of degree. Tani discloses a platinum film resistor 14 that can be produced by thin or thick film techniques for use as a temperature sensor (sputtering or screen printing – col. 3, lines 49-52) such that it would have been obvious to employ either type of platinum film where both are known in the temperature sensor resistor arts. Murata at col. 4, lines 1-12 also discloses that the platinum temperature sensing film may be thin or thick for use as a temperature sensor in a multilayered sensor such as that of Friese. One would be motivated to interchange the two depending on the equipment and materials available, or the response desired. In Friese, the glaze layer 4 is the connecting layer, described as a frame, such that it is in the border area as a sealing frame, creating a void where the platinum sensor is located. A glaze is “a smooth, thin, shiny coating” Webster's II, New Riverside University Dictionary. Also, the YSZ is a glass. As an alternative, in Gerblinger et al., the glass layer US is used to connect a thin or thick film layer to a ceramic layer, see abstract, for the purpose of protecting the thin film platinum layer, so that it would have been obvious to employ the glaze layer and thin film resistor in the Friese et al. Device (thus meeting claim 17 also). The frame of Friese is depicted as a hermetically sealing frame surrounding the resistor 6 in Fig. 2, and described as a frame, see col. 3, lines 53-60, col. 5, lines 21-52. The ceramic cover and ceramic substrate are either 3, or films 1 and 11. The additional layers meet claim 16. See col. 5, line 50-51, col. 4, lines 8-14. In claim 14, the ceramic substrate 4 is alumina. In claim 15, the cover layer 4' at Fig. 2 is alumina. In claim 16, film 11 meets the claim as a cover layer and it is on the peripheral edges, as well as the remaining portions.¹

In response to this rejection, independent Claim 5 has been amended to recite:

Claim 5. Platinum temperature sensor comprising:

a ceramic substrate;

a platinum thin-film resistor applied to the ceramic substrate;

a ceramic cover layer; and

a connecting layer made of a glaze comprising a glass that is applied to the ceramic substrate in a frame-like shape in a border area surrounding the platinum thin-film resistor by means of which the ceramic cover layer is connected with the ceramic substrate in such a way that the platinum thin-film resistor is sealingly encapsulated with regard to the environment, wherein an interior portion of the connecting layer defines a void within which the platinum thin-film resistor is disposed, and wherein a portion of the ceramic cover layer coincident with the void defined by the interior portion of the connecting layer is disposed directly adjacent to the platinum thin-film resistor.

Neither Friese et al. '007, Tani et al., Murata et al., nor Gerblinger et al. teach or suggest the use of a frame-like connecting layer that allows a portion of the ceramic cover layer to be disposed directly adjacent to the platinum thin-film resistor. Friese et al. '007

¹ Final Office Action, pp. 2-3.

teach that insulating layer 3" and sealing frame 4' are disposed between all portions of resistor track 6 printed on insulation layer 3 and hermetically sealing frame 4 (both printed on ceramic film 1) and ceramic film 11 (the ceramic cover layer). See Figs. 1 and 2. Tani et al. teach that protective glass 20 (the ceramic cover layer) covers platinum film circuit 14 without the use of any frame-like connecting layer. See Fig. 1. Murata et al. also teach that ceramic sheet 14 (the ceramic cover layer) covers platinum resistance pattern 11 without the use of any frame-like connecting layer. See Fig. 1. Finally, Gerblinger et al., like Friese et al. '007, teach that lower glass layer US is disposed between all portions of platinum resistive layer Pt and upper ceramic layer OS (the ceramic cover layer). See Fig. 2. Thus, the present invention's use of a frame-like connecting layer that allows a portion of the ceramic cover layer to be disposed directly adjacent to the platinum thin-film resistor is novel.

Advantageously, the platinum thin-film resistor of the present invention is substantially not in contact with any glaze comprising the frame-like connecting layer, such that problems with electrochemical decomposition of protective glazes when in contact with current-carrying thin-film resistors at high temperatures are avoided (see specification, p. 2, lines 6-17; p. 4, line 36-p. 5, line 19; p. 7, lines 20-26; and p. 8, line 32-p. 9, line 6). None of the references cited by Examiner that use a connecting layer (Friese et al. '007 and Gerblinger et al.) include any hint or suggestion regarding the decomposition problems encountered when making use of a "full area" connecting layer made of a glass. Thus, one of ordinary skill in the art would have no motivation to depart from the usual practice of using such a "full area" connecting layer made of a glass (or no connecting layer at all), especially in light of the fact that a "full area" connecting layer made of a glass provides acceptable sealing performance.

For the above reasons, Applicant submits that the rejection of independent Claim 5 and dependent Claims 14-17 under 35 U.S.C. 103(a) is now improper and respectfully requests that the rejection be withdrawn.

Rejection of Claims 5 and 14-17 Under 35 U.S.C. 103(a) – Friese et al. '007, Tani et al., and Wienand et al.:

Claims 5 and 14-17 also stand rejected under 35 U.S.C. 103(a) as being unpatentable over Friese et al. '007 in view of Tani et al., as applied to the claims above, and further in view of Wienand et al. (U.S. Patent No. 5,831,512).

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Rejection of Claims 16 and 17 Under 35 U.S.C. 103(a) – Friese et al. '007, Gerblinger et al., and Wienand et al.:

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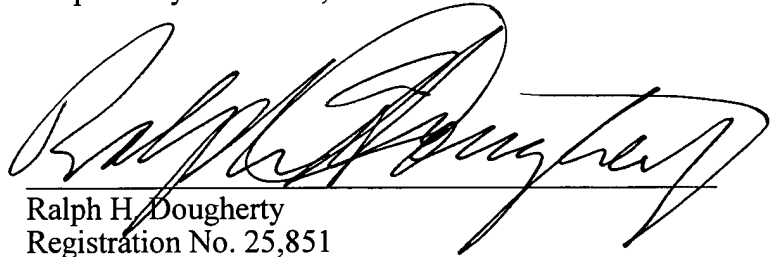
CONCLUSION

Because this Amendment and Response does not add more claims than previously paid for, no additional fee for claims is currently required.

The fee of four-hundred and fifty dollars (\$450.00) for a two month extension of time are enclosed; as well as the filing fee of seven-hundred and ninety dollars (\$790.00) for the Request for Continued Examination (RCE).

In view of the foregoing amendment and remarks, the present Application is now believed to be in condition for allowance, and such action is respectfully requested on behalf of Applicant.

Respectfully submitted,

A large, stylized handwritten signature in black ink, which appears to read "Ralph H. Dougherty". The signature is written over a horizontal line.

Ralph H. Dougherty
Registration No. 25,851
Christopher L. Bernard
Registration No.: 48,234
Attorneys for Applicant

DOUGHERTY, CLEMENTS, HOFER & BERNARD
The Roxborough Building
1901 Roxborough Road, Suite 300
Charlotte, North Carolina 28211 USA
Telephone: 704.366.6642
Facsimile: 704.366.9744



Attorney Docket No. 3193DIV

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Art Unit 2832 (Examiner:Karl D. Easthom)
Applicant Heinrich ZITZMANN
Application No. 10/679,661
Filed October 7, 2003
Title PLATINUM TEMPERATURE SENSOR

Charlotte, North Carolina
September 27, 2004

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450 USA

AMENDMENT AND RESPONSE

Dear Sir:

In response to the final Office Action mailed July 23, 2004, rejecting Claims 5 and 14-17 of the above-referenced Application, Applicant respectfully requests that the following amendments be entered and remarks be considered. In view of these amendments and remarks, Applicant submits that the Application is now in condition for allowance and respectfully requests such action.

AMENDMENTS TO THE CLAIMS

Please amend Claim 5 of the Application as follows, without prejudice or disclaimer to continued examination on the merits; the status of all claims being as indicated:

Claims 1-4 (canceled)

Claim 5 (currently amended): Platinum temperature sensor comprising:

a ceramic substrate;

a platinum thin-film resistor applied to the ceramic substrate;

a ceramic cover layer; and

a connecting layer made of a glaze comprising a glass that is applied to the ceramic substrate in a frame-like shape in a border area surrounding the platinum thin-film resistor by means of which the ceramic cover layer is connected with the ceramic substrate in such a way that the platinum thin-film resistor is sealingly encapsulated with regard to the environment, wherein an interior portion of the connecting layer defines a void within which the platinum thin-film resistor is disposed, and wherein a portion of the ceramic cover layer coincident with the void defined by the interior portion of the connecting layer is disposed directly adjacent to the platinum thin-film resistor.

Claims 6-13 (canceled)

Claim 14 (previously presented): Platinum temperature sensor according to claim 5 wherein the ceramic substrate is made of Al_2O_3 .

Claim 15 (previously presented): Platinum temperature sensor according to claim 5 wherein the ceramic cover layer is made of Al_2O_3 .

Attorney Docket No. 3193DIV

Claim 16 (previously presented): Platinum temperature sensor according to claim 5 wherein a sealing cover is applied to the outer peripheral edges of the layer structure comprising the ceramic substrate, the connecting layer, and the ceramic cover layer.

Claim 17 (previously presented): Platinum temperature sensor according to claim 16 wherein the sealing cover is made of a glass.

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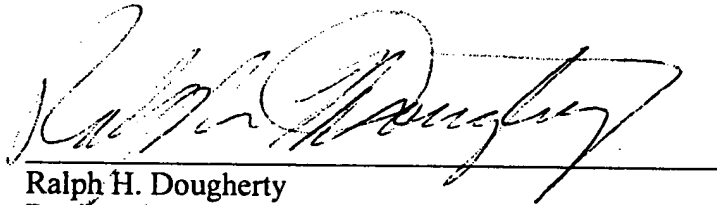
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DOUGHERTY, CLEMENTS, HOFER & BERNARD
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Charlotte, North Carolina 28211 USA
Telephone: 704.366.6642
Facsimile: 704.366.9744